Plaza Plans and Settlement Patterns: Regional and Temporal Distributions as Indicators of Cultural Interactions in the Maya Lowlands

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ABSTRACT
The identification of a series of plaza plans at Tikal, Guatemala and studies of specific examples through time provide some understanding of ceremonial and residential activity at the site. Comparative studies within the site reveal the complexity of this city and the nature of the structural groups (plaza plans). Using these units one may distinguish several types of ceremonial groups as well as several types of residential groups and infer a function for each. Applying these observations to other sites, Maya and non-Maya, provides a means by which comparative evaluations may be made. These evaluations, of the numbers of distinct «groups» within a site as well as the range of differentiation among the groups within a site, depend on detailed maps that were not available at the time of the plaza plan proposal. Examination of detailed maps of sites and subsequent excavations in the Maya area permit conclusions to be drawn regarding the integrity of the Northern and Southern zones of this area, to suggest cultural and linguistic boundaries and spheres of influence, trade nets, and perhaps origins and culture change.

Key words: Maya Lowlands, Tikal, plaza plans, cultural interactions.

Planos de plaza y patrones de asentamiento: distribuciones regionales y temporales como indicadoras de interacciones culturales en las Tierras Bajas mayas

RESUMEN
La identificación de una serie de planos de plaza en Tikal, Guatemala, y los estudios de ejemplos concretos a través del tiempo proporcionan una comprensión de la actividad ceremonial y residencial en el sitio. Los estudios comparativos dentro del sitio revelan la complejidad de esta ciudad y la naturaleza de los grupos estructurales (planos de plaza). Utilizando estas unidades, se pueden distinguir varios tipos de grupos ceremoniales y varios tipos de grupos residenciales e inferir una función para cada uno de ellos. La aplicación de estas observaciones a otros sitios, mayas y no mayas, proporciona un medio para poder hacer evaluaciones comparativas. Estas evaluaciones, tanto del número de «grupos» distintos dentro de un sitio como del ámbito de diferenciación entre grupos en el mismo, dependen de la existencia de mapas detallados que no estaban disponibles en el momento en que originalmente se propuso la identificación de los planos de plaza. El examen de tales mapas y las subsecuentes excavaciones en el área maya permiten extraer conclusiones con respecto a la integridad de las zonas septentrional y meridional de dicha área, sugiriendo la existencia de fronteras culturales y lingüísticas así como esferas de influencia, redes de comercio y, tal vez, orígenes y cambios culturales.

Palabras clave: Tierras Bajas mayas, Tikal, planos de plaza, interacciones culturales.

1. Introduction

Despite rare flashes of insight leading to inductive «discoveries,» (Becker 1975), my wanderings through scholarly glens tend to follow a largely deductive path (Becker

1972, 1979a). This approach has led to the recognition of the significance of an important aspect of the settlement pattern that existed at Classic Period Tikal; patterned arrangements of structures within specific residential groups, or households, as well as some ritual groups. Each architectural pattern recognized had been designated as a Plaza Plan. Plaza Plan 2 (PP2), the pattern that was central to these studies, is a group plan characterized by the presence of a ritual structure with a relatively square base on the eastern side of an architectural group (Becker 1999). These structures cover burials of important persons. In small residential groups this defining structure may be the smallest of all the structures, yet it includes the burials of the significant ancestors of the household and thereby defines the «religious affiliation» of the group (Becker 1986a). I now believe that PP2 emerged from a slightly different pattern that existed at an earlier date; the pattern long recognized and identified as «E-groups.» This thesis is but one of many that remain to be tested.

The original intent of the research for this paper was to demonstrate how Plaza Plan 2 was distributed beyond the site of Tikal, Guatemala and to use that information to suggest regional as well as temporal distributions to indicate ancient Maya cultural interactions. The summary offered below presents the original theoretical line upon which many a model may be hung. In 1979 this paper was intended to serve as an encouragement rather than as a guideline for how future studies might augment this statement. Although unpublished for 33 years and for most of that time available only in mimeographed form, surprising numbers of students found it useful in developing a method by which they could study the cities of the Classic Period Maya. These students share two traits: an ability to recognize the utility of Plaza Plans in organizing research involving Maya polities and supervisors unconstrained by the politics and pettiness of many (most?) Maya studies. Those political forces, so common to academe, had caused me to direct my research beyond the Maya world. Only slowly did I learn that «politics and pettiness» (P&P) are as much a cross-cultural rule as Plaza Plans (PPs) are to Maya settlement patterns.

Once again I am placing this suggestion regarding PPs before my colleagues in Maya archaeology. In short, a Classic Period Maya city can be seen as a series of architectural units or groupings that enable excavators to predict a number of aspects of the site and to direct excavations accordingly. In the years since 1979, when this paper was first presented and long after PP2 was first defined at Tikal, there has been an enormous effort to map and to understand Classic Period Maya sites. Cobá (Folan et al. 1983) and Sayil (Sabloff and Tourtellot 1991) are but two of the many impressive sites that have been mapped in great detail. In recent years the maps of scores of smaller sites also have been made available. Collecting them will be a useful project for a diligent scholar. While we await the completion of that task, the listing made in 1979 is at last being published, but with only a minimal effort being made to update the 1979 version. Many items that were in press or available only as papers in 1979 have been published, and those published versions are cited here. Some other data from after 1979 has been added to demonstrate the value of this approach, but still more needs to be assembled in the future.

2. Background

For more than a century Maya scholars have expended considerable energy discussing the theoretical structure of Maya sites (see Maler 1908). Just as Maya scholars were beginning to make strong shifts from the traditional archaeology of the past, several authors (e.g. M.D. Coe 1965) presented more anthropologically oriented theories, but without equal efforts at presenting the results of actual excavations or formulating excavation strategies to test their ideas. When I came into Maya archaeology in 1960 the texts had not been deciphered and there was still disagreement over whether the figures on carved monuments were humans or deities. In 1960 the mapping of Tikal was just being completed, with the result being an obvious city of some considerable extent. By 1962 we were able to plan an excavation program around specific questions. Perhaps more important, we were able to shift strategy during a field season to take into account the findings being uncovered. Settlement archaeology had come of age (see Adams 1968). Adams went on to apply his ideas in Mesopotamia (1969), but very few Old World or New World scholars committed themselves to following his advice. Given the politics in American archaeology, it is not surprising that, aside from the efforts of cost-effective looters, the best applications of PP2 research are made by our European colleagues (Źrałka *et al*. 2011, also 2012; Źrałka 2007). Despite the protestations of some of my colleagues, I now find extremely limited evidence for Maya settlement studies or urban excavations that are based on specific efforts to understand (predict) what will be found (culturally patterned behavior in the form of archaeological evidence). There appears to be a great disconnect between vague theories and actual excavation strategies.

Discussions regarding Maya sites as vacant «ceremonial centers» resulted from a 1927 fabrication for popular consumption that its author J. E. S. Thompson never used in his own scholarly efforts. The accompanying arguments for this fable were entirely based on maps of site cores, with any small structures evaluated as the temporary residences of peasants coming to the «ceremonial center» for ritual reasons (see Becker 1979a, 1979b). This model was (and is) promulgated by so many individuals that it long overshadowed the basic research into site organization and settlement patterns. Since the early 1930's a growing number of scholars recognized not only the considerable extent of ancient Maya towns, but the importance of excavating the small structures within them. Those small structures were recognized by the more astute archaeologists of the pre-War generation as having residential functions (see Stenholm 1978). Although never stated clearly, by the 1970s the Tikal Project's excellent maps (Carr and Hazard 1961) had altered the ways in which ancient cities were understood. The idea that small structures had been the permanent residences of people of various classes has grown to include virtually all contemporary Maya scholars. Younger scholars misinterpreted older texts and continued to use the designation «ceremonial center» for the epicenter (or elite ritual zone) of a site rather than its original application to the entire site. This conceptual shift is interesting as it occurred as new conceptual errors were being made indicating the need for fine tuning our scholarly machine. The most simplistic of these errors involved the treatment of each individual structure (most often just the surviving platform for a small, perishable

building) as if it were a «house.» This technique has served some odd purposes, often increasing the «house count» of a site and therefore enabling excavators to propose large populations for such sites (but, see Turner 1976).

In fact, when the maps and excavation drawings from a site are studied one recognizes that structures at lowland Maya sites tend to cluster, or to be grouped around one or more contiguous courts or plazas (see Becker 1973: 397-398). These observations suggest that individual mounds (structures or platforms) rarely stood alone, but commonly functioned in an aggregate or compound-like unit. These «units» were residential compounds, exactly like the «modern Maya houses» described by Wauchope (1938). Such «houses» would consist of a number of separate structures each with a different function, in the way that European houses have evolved as aggregates of rooms with differing functions but all under the same roof (Becker 1982). The «household» or residential population of such a compound probably was an extended family.

Of great importance in regard to the clustering of structures at Maya sites is the observation that these sites include a wide variety of different types of clusters of buildings (generic categories) which lead us to consider functional interpretations. Only a few seem to be recognizable as either purely ritual or purely residential (see Coggins 1967; Tourtellot 1988). We have compared sites, and named entire regions (explicitly or implicitly) on the basis of «style» for a long time. Now we may consider comparisons of other criteria which are in many ways more amenable to quantification. Such observations cannot be made with ease, but derive from studies of the extent maps and excavation drawings of numerous sites. Since detection of regularities is by map examination rather than excavation, large groups will be easier to identify while small residential clusters will be apparent only when extremely fine maps are available. Our interest in these data and their importance derives from the following considerations:

1. If Maya sites are extensive in area, then our understanding of the sites and their builders depends on knowledge of all parts of a site. Can we determine if site development was itself planned?
2. If all constructions at a site were similar in general characteristics, as inferred from surface inspection, then a random testing would be in order. However, close scrutiny suggests that many regular architectural patterns, or groupings of buildings, can be identified. Describing these and testing them facilitates examination of a site (Becker 1971, 1999; also see Culbert 1974: 14).
3. If large sites can be studied in terms of the distribution and functions of specific groups or clusters of structures then the research designs must take into account similarities and differences between groups as well as location within a site. Temporal differences also must be considered (see Rice 1978).
4. Architectural differences within a site lead scholars to infer differences in group function. Such inferences may be tested by seeking differences in artifact assemblages, burial customs, etc., as related to specific architectural groups. These differences may reflect differential status such as H. Nutini (1968, and subsequent publications) pointed out for residents at Tlaxcala.
5. The presence of an identifiable architectural pattern, either in the form of a single structure or as a grouping of structures, at two or more sites suggests some «degree of shared ideological and/or functional concepts» (Chase and Chase 1982).

6. Differences between the form of a pattern or presence versus absence may be important in distinguishing outlying areas from urban areas (see the analysis of survey maps by D. Rice [1976]).

Too often what passed for settlement studies in the Maya realm, and elsewhere, were vague, impressionistic descriptions of sites similar to those presented by the explorers of the 19th century (but, see Wrotenbery and King 1977 for another view). Despite a continuing concern with the important general concepts related to site location and with central place theory as they apply to the placement of Maya cities and towns (see Voorhies 1972; Turner and Doolittle n.d.; also Flannery 1968), none of these ideas have been demonstrated to be predictive. In some ways these views have morphed into the equally vague «landscape archaeology» of today, suggesting that trendy terms rather than «science» dictates much of the archaeological action that is quite expensive. Many scholars claim to be concerned with understanding the internal configuration of Maya sites, but in science this means «prediction.» In addition to excavating the central, and richest, areas of Maya sites numerous researchers continued to recognize that the small structures that constituted the bulk of a site were very important. Studies of groups of structures provide not only a means by which research designs may be focused but also the direct evidence for societal complexity. Flannery (1972: 409), building on Rappoport's work (1971), notes that these goals may be achieved by learning about «*segregation* (the amount of internal differentiation and specialization of subsystems) and *centralization* (the degree of linkage between various subsystems and the highest-order controls in society ...).» We have data from the architectural assemblages of the elite, now we need to know more about the residences and other architectural aspects of the other members of Maya society in order to understand fully the operation of the ancient Maya. Flannery (1976), in commenting an analysis on the household level, notes that no work prior to his provided information on the *range* of dwelling types within a region or the range of differences between regions. Flannery studied «household clusters» predating 850 B.C. This paper is concerned primarily with the periods following, with major emphasis on the Classic period. Unfortunately, many recent attempts to study «household» units still attempt to categorize these aggregations on the basis of group size (Willey et al. 1978), a criterion with but limited potential. The concept of identifying groups on the basis of structure arrangement or pattern, which was suggested above, actually has been applied in the recognition of two different types of structure groupings, the functions of which were also implied. One such grouping is that of ballcourts, each of which consists of two or more structures surrounding a central «playing alley» (see Blom 1932). This will be discussed below in the context of Tikal. A second grouping also recognized at Uaxactun by Blom (1924: 218) is the «E-Group» pattern, later seen as a widespread pattern by Ruppert (1940). Although these groups, which generally consist of four structures (three aligned in a row N-S and a fourth oriented at the equinox line of the central of these three), have been discussed often, elaborate but irrelevant theories have been paired with these groups (see Rathje et al. 1978). To date nothing has surpassed Ruppert's observations, and only excavation of these groups may advance our understanding of them. This observation regarding E-groups made in 1979 has generated only passing curiosity but not, to my

knowledge, any effort to excavate and understand this «Plaza Plan» that I believe to be ancestral to PP2.

To some extent the development of an awareness of the presence of small structures is tied to the importance assigned to them. In many ways the development of ideas regarding the composition of a site reflects understanding of small structures and the development of mapping techniques by which they might be recorded accurately. The evolution of site maps from Gann (1900) as well as Gann and Gann (1939), where mounds were noted simply as round blobs, to the Tikal map (Carr and Hazard 1961) with accurate interpretation of the original configuration of the structures parallels the increase in knowledge about sites and how one may approach their study. Unfortunately, studies at many sites (see Ashmore 1977) do not necessarily result in maps with sufficient detail to be of use in comparative studies. Furthermore, map studies do very little in helping to determine if structures use was contemporaneous (Ashmore 1981). Thus, we are faced with the need to produce better maps plus the need to check these maps through programs of excavation.

3. The Tikal Map: New Horizons

Satterthwaite's (1944: 3, 19) attempts to relate structure form and structure function were useful in the study of ceremonial structures. More recently, efforts have been directed toward expanding this technique for interpretation of function to apparently non-ceremonial structures. Bullard (1960: 357) attempted to evaluate building function from surface observations made in northeastern Petén. Although some degree of accuracy may have been achieved, no intensive excavations were directed toward proving the various hypotheses made on the basis of surface inspection. However, all of this work was done in the limited context of what was «known» about specific sites as reflected in the site maps. The map of Tikal, Guatemala (Carr and Hazard 1961) was the first to offer a thorough and accurate depiction of the structures over a large portion of the area covered by a major Maya site beyond the central and presumably «ceremonial» area. The detail, including recognition of platforms as low as 20 cm. in height, resulted from the diligent efforts of a group of mappers some of whom became unparalleled specialists in locating the indicators of even the smallest construction. In addition, extensive testing of these supposed structures provided feedback to the mappers as well as information about the site.

The Tikal map demonstrated that the kinds of structure aggregations known at other sites existed at Tikal and was a characteristic of the settlement pattern. Inspection of the map reveals the existence of nearly 700 separate clusters of buildings. Each of these has been given its own group designation (Becker 1982). The special relationships suggest interdependence between the structures in a single group, or plaza unit (see Leventhal 1981). Considering the «principle of abundance» one might consider each group as a residential unit unless it conforms to a pattern suggesting different basic functions. This residential function is directly indicated by few means such as the presence of a «kitchen» structure in each group. Haviland (1965: 21) identified structures at Tikal as kitchens based on the following evidence: low, small

size and square plan, and location off the shorter end of low rectangular platforms presumed to have been residences; plus presence of artifactual evidence of domestic functions such as *metate* and *mano* fragments, sherds of utilitarian pottery, and considerable ash and carbon in midden-like deposits.

Therefore, most of the groups of buildings at Tikal, and presumably other Maya sites, functioned as single residential units. Such units, called *sitios* by Vogt (1961: 136), appear to be clusters of buildings, each of which had a separate function, that are clustered about a single plaza or about a plaza and its subsidiary courts. These residential groups (PP2) were not the first to be identified at Tikal as conforming to a consistent architectural pattern. During the early surveys of Tikal, several architectural groupings were noted as including paired flattopped pyramids and other features which characterized them. A detailed investigation and analysis of these groups (e.g. Gr. 5C-l) was undertaken by Jones (1969), who concluded that they all conformed to a single regular plan that could be designated as Tikal Plaza Plan 1. Jones's verification of a regular and highly predictable pattern for these «twin-pyramid groups» suggested that the concept of the «group» might serve to order the large number of architectural groups at Tikal into a relatively small number of categories. Each of these «types» could then be investigated as an entity in itself. This would enable consideration of these in several dimensions:

1. Time: Do group patterns change through time (the earliest Plaza Plan 1 at Tikal dates from 9.9.0.0.0. or 613 A.D.).
2. Space:
   a) Do variations of a pattern occur with a site, or are specific types found only in specific locations.
   b) Do any of these plaza plans occur, with all their details, at other sites and what is implied by such distribution (both in space and time).

Furthermore, the very demonstration of variations in group functions implies complexity in ritual and economic aspects of the culture. If differences in type of residential groups or «classes of mounds» (Sears 1958) could be demonstrated we could consider these to provide direct evidence for complex society (see Struever 1971: 14-15).

During the mapping of Tikal, Richard S. Wurman noted that many of the groups of structures had a peculiarly small but relatively high construction along the eastern edge of their respective plazas. Inspection of the completed map revealed that a considerable number of such groups could be recognized from the surface. Becker (1971) demonstrated that these conformed to a single type which was designated Tikal Plaza Plan 2. The critical information sought from these excavations were factors relating to recognizable architectural distinctions in one or more structures. These features can then be used to define regularities which are consistent from group to group and thereby define a second Plaza Plan at Tikal. Of significance is that the structures located in a relatively central position on the east of these groups appear from the surface to be uniformly small, relative to other structures in the group, square in plan, and relatively tall. Excavations were directed toward demonstrating that these architectural features, which are visible by surface examination of the unexcavated mounds cove-

ring the presumed structures, could be correlated with other features (e.g. burial pattern). The demonstration of regularities in these features from structures in the same position within their respective groups characterizes the second Plaza Plan at Tikal.

The recognition of traits by which a single structure in a group can be demonstrated to be distinct in form from all the other structures in that group, and these distinct structures are similar in form from group to group, provides a means by which certain architectural groups at Tikal can be recognized and categorized. As demonstrated by visual observations and surface indications the structures on the east of the nine groups on this peninsula appear to have an extremely high ratio of width-to-length (generally above 0.90). Not only were a great number of Plaza Plan 2 groups recognized at Tikal (the earliest dating from ca. 200 CE and recognized only by remnants within Gr. 4F-2), but excavations in 1963 were designed to test how well they could be distinguished from other groups. Trait analysis shows a distinct mortuary assemblage which distinguishes each structure on the east from others within the group (Becker 1971, 1999) and also provides indications of the functions of these buildings.

The converse also may be true. That is, a series of related non-architectural traits (stelae, iconographic details, etc.) may provide indicators of a specific plaza plan (Cohodas 1973; Pasztory 1977). If we consider surface observation to be a first level of identification and the statistical analysis of information gained through excavations as a second level, then the analysis of traits provides a third level of identification. This third level may be considered as a primary target of field research –the goal of providing a functional analysis of the information derived from excavations. Ultimately these three levels of reasoning should enable archaeologists to consider a fourth level –why changes occur (Martin 1971: 3-4). On the basis of these first three levels of analysis one can only conclude that «rectangular» groups at Tikal that have a relatively square and tall structure on the east and relatively rectangular structures in other positions conform to a distinct plan which will be designated as Plaza Plan 2. Furthermore, consideration of those traits which distinguish the structure on the east from structures in other positions indicated a ritual function for the former. This conclusion regarding building function distinguishes one building in the groups conforming to Plaza Plan 2 from the other buildings. These other buildings are assumed to be residential. The nature of this association suggests that the building on the east may have functioned as a shrine within a primarily residential group. E. H. Thompson provides the most concise statement regarding this ritual structure and its probable function:

> «In the little we know of the customs and life habits of this ancient period, it is certain that at intervals of time and especially after the death of great personages they made changes in their structures, remade wall surfaces obliterated old mural paintings with a coating of hard finish, and made entirely new floors in the chambers beneath whose floors were the last buried remains. Consequently, it is well within the bounds of reason that the structure crowning this mound served as a religious shrine or *adoratorio* (*Ku*) of some important personage, and at his death or the death of the last of his line it was razed above his burial vault as the last mark of reverence to his memory» (E. H. Thompson 1938: 38).

Thompson's observation relates architectural features with other cultural behaviors which can be recognized archaeologically. Of note in this regard is Ruz's survey of funerary practices. Although Ruz (1965: 459) gives minimal attention to architectural associations and concentrates on tomb typology he does note the custom of burying «victims» at the inauguration or termination of the use of civil or ceremonial buildings. Unfortunately, he does not note where such burials occur. A variant form (Plaza Plan 2B) may include a ritual structure to the east of the group with a long low mound adjacent to it on the north. This pattern exists at Tikal and possibly at La Libertad and Izapa. Gareth Lowe (pers. comm.) suggests that this pattern may have middle Preclassic origins. A third variant (Plaza Plan 2C) may include groups with a pair of ritual structures on the east. One example appears near the Tikal airstrip and another may include Strs. 19 and 20 at Los Naranjos, Honduras (see Table 1, and also Aveni and Gibbs 1976).

4. Interpretations at Tikal

Plaza Plan 2 is established by the Early Classic, and Preclassic examples would not be unexpected. The pattern is common during the Late Classic and the evidence suggests that as a group arrangement the incidence of PP2 increases. This suggests that there may be a centripetal force in religious orientation. That is, that the inhabitants of Tikal are increasingly drifting away from a ritual focus at the central area of the site and increasing turning to ceremonialism in conjunction with their own extended family members. This could be seen as a decentralizing effect resulting from an increase of population. On the other hand, this entire development may only reflect increasing wealth at the site. If the ceremonial buildings at the center of the site are the principal ritual structures for the elite then each extended family always may have had their own ritual (shrine) area. Greater wealth would enable what was a formerly unrecognizable (archaeologically) feature such as a household shrine, niche, table, etc., to be expanded into a separate structure. The vastly increasing activity at the center of Tikal (North Acropolis area) indicates that the absolute resource availability is similarly augmented. Given the integration of the site one would expect that other areas of the site share in this development and express greater wealth in architectural elaboration.

Various Maya scholars agree that differences in numbers of structures in a group, building form, elaboration, plastering, etc., may reflect differences in social class (Becker 1986c). The recent suggestion (Becker 2004) that these variations may reflect only differences in wealth is based on plaza plan data (see also Becker 2003b). If we assume that the residents of a city such as Tikal who employ the same type of plaza plan for their residences are all kin (as in the same moiety), then variations in the size of that specific plaza reveals differences in wealth. Some of these Plaza Plan 2 groups, such as Tikal's Barringer Group, are so large that were they found at a location isolated from Tikal they would be considered interesting and significant sites by themselves. This suggests that the inhabitants were economically, if not socially, quite distinct from many of their co-residents at Tikal. In addition to the many large

and small groups which conform to this Plaza Plan at Tikal there is the probability that Temple I conceptually fits this pattern.

Jones (1977: 42-45) notes that Tikal Ruler A, inaugurated 9.12.9.17.16 and died ca. 9.15.0.0.0, is buried in Temple I (Tikal Burial 116). The grave, cut through the earlier structure at the locus and down into bedrock, is sealed by the massive building in perfect Plaza Plan 2 pattern. This burial conforms to a basic rule for initiating a Plaza Plan 2 at a locus where none previously existed: the grave of the initiating (founding) burial must be cut through any pre-existing building at the locus and into the bedrock. The burial of Ruler A, whose kin-line utilized the PP2 tradition, shifted the focus for Great Plaza burials away from the North Acropolis. Jones (1977: 58) points out that Ruler A «presided over a renaissance of sorts, erecting the first known carved monuments ... since Stela 17 at least 100 years before.» I suggest that at Tikal there are two major traditions that can be recognized by the use or the non-use of Plaza Plan 2. The PP2 tradition uses this group arrangement to describe a plaza plan that focuses on the interment of respected elders; the other tradition uses a pattern that has no ritual structure on the east.

The inauguration of Ruler A, which at least marks a shift in generating a revival of carved monuments, may reflect the rise to power of the lineage associated with Plaza Plan 2. Tikal, as a large city, with a population of perhaps 10,000, sustained a number of diverse classes and lineages. This new ruling lineage may be related to, or descended from, the kin group resident in Group 7F-1 in southeastern Tikal. Structure 7F-30 in this group, as well as the adjacent structure, contains a series of elaborate burials, and the general pattern is that of Plaza Plan 2. Jones (1977: 58 after Coe 1965: 42) also suggests that «The imposing Structure 5D-33-1st might have been built during this period…» The burial associated with that construction may be the preceding ruler of Tikal, or as I believe a co-ruler (see below). Ruler A «might have been more interested in the affairs of state than Ruler B...» suggesting either personality distinctions, as Jones (1977: 58) suggests, or political differences. I have suggested that there were dual «leaders» at Tikal and other sites, with their duality reflecting the moieties within their society (Becker 1975, also 1983b, 1984, 1988b, 1990, 1994, 2004). Tikal rulers A and B may have been contemporaneous, but with distinct leadership functions. Ruler A was the external affairs leader, and thus the war leader, while Ruler B had responsibility for «internal» affairs, such as water control (Fialko 2000, see also Becker 2010). Not surprisingly, Tikal Ruler B's tomb remains unknown. Jones (personal comm.) suggests that he may be interred in the East-facing Temple IV, but I believe that he is in a lesser structure that faces west, such as Temple VI. No evidence places him strongly in a patriline with Ruler A, reinforcing my belief that these two rulers represented, at the same time, the different moieties at Tikal (see Becker 1975). These distinctions of polity suggested here may explain differences in monument inscriptions produced for Ruler A and Ruler B as described by Jones (1977: 58). Such political changes may also account for missing rulers in the Tikal (and other) dynastic lists (see also Coggins 1975; Haviland 1977).

Alternately, Jones (1977: 59) suggests that Ruler A may have revived Tikal via massive public works development or foreign trade, which subsequently decreased over the years before 790 AD. Rulers B and C may have attempted to lead in the face

of declining popularity by launching «make-work» projects. These programs would have employed local people and provided an economic stimulus. The decline in trade, probably due to changing trade routes and economic patterns, ultimately rendered the leaders of Tikal unable to maintain the huge ceremonial structures. Gradually people moved to smaller, peripheral sites, and presumably took their various and specific plaza plan concepts with them.

5. Plaza Plan 2: Distribution in the Maya Area

Simply because a specific group pattern can be demonstrated at Tikal does not guarantee that it will be found elsewhere. Settlement patterns may vary tremendously from site to site. However, having established the pattern at Tikal the author became aware of the significance of demonstrating that this plaza plan existed at other sites. This could provide information regarding culture areas and interaction spheres not answered satisfactorily by the theoretical literature (see Freidel 1979). The inception of the University Museum's Quiriguá Project directed the author's attention to maps of that site. I perceived the principal architectural group at Quiriguá to be a parallel of Tikal Plaza Plan 2 (Becker 1972). Subsequently this prediction was confirmed by excavations, although the politics of the period deliberately avoided excavation of the key structure (on the east) and then led to an obfuscation of the findings. Of interest is the possibility that at Quiriguá this pattern was abandoned quite early, possibly a feature that was significant in the culture history of the site (Ashmore 2007). The relationship between Tikal Plaza Plan 2 and the *oratorios* or group shrines known at Mayapan (Pollock 1962: figs. 11, 12a-u) also may shed light on the process of culture change (Becker 1991; see also Thompson and Thompson 1955: 237-242 for description and interpretations).

Temporal changes are a principal area that we should be seeking to demonstrate throughout the Maya area. Although the intent of this paper had been to focus on the area of the lowland Maya, other Mesoamerican areas present relevant architectural evidence worth noting. Ultimately, a search for the distribution of correlates to Tikal Plaza Plan 2 should consider possible North American connections, especially with the Mississippian Culture. The peculiar burial-temple platform relationships found at sites in the Ohio valley should be explored as one of the many traits which may have originated in Mesoamerica (see Griffin 1966). Possible relationships with the Gulf coast of Florida also should be explored (Bullen 1951, 1953, 1966). Peebles and Kus (1977) add to the possible territorial range of Plaza Plan 2, extending it far into North America. They also give useful ideas regarding the relationship between caches and burials in these contexts (see Becker 1992, also 1963, 1988a, 1993).

6. An Introduction to the Site List

During the 1962 field season at Tikal, the accuracy of the map was demonstrated while conducting the Plaza Plan 2 research. Archaeological recovery yielded on-the-

ground results that were within 5% of dimensions of structure plans as calculated from the map. Errors of as much as one meter were rare, and tended to occur where the collapsed debris of a vaulted structure distorted the configuration of the substructure. Richard Wurman's field observation that many groups had peculiarly small, squarish structures on their eastern margins, were proven to be quite accurate. In most cases width-to-length ratios of small structures could by closely predicted from either surface observation or from the map. On this basis one may conclude that accurate maps provide an outstanding tool for developing research problems and planning a field campaign.

One variable must be noted. Accuracy in mapping is inversely proportional to size of mound examined. In small structures and particularly those with pole-and-thatch buildings, the relatively small amount of collapsed material does not significantly distort the configuration of the substructure. Jones (1969: 40) found map errors at Tikal of several meters at the larger buildings that he excavated. These impressive constructions were much larger than any excavated in 1962 (Becker 1999). Str. 5G-8, the largest of the structures among the nine groups studied in 1962 has a base of only 12.94 by 14.28 meters; smaller than most of the structures excavated by Jones. A 5% map error for this structure amounts to less than one meter over the maximum dimension.

In 1979, when this listing was begun, the mapping project at Copan (Proyecto Arqueológico Copán) was attempting to duplicate the precision of the Tikal map. At Copan more than 50 years of clear-cutting the dense rainforest provided the mapping crews with a cakewalk. Maps in parts of Yucatan have the potential for achieving similar accuracy, but in forested areas extreme efforts are necessary in order to produce a map of the detail needed for comparative work such as that intended by this study. Sadly, the rainforest that still preserved many sites in the Maya lowlands is disappearing. Clear-cutting is only the first step to site destruction, with looting and bulldozing soon following. These cost-efficient economic activities outstrip any efforts by archaeologists to map and excavate these ancient sites. Sadly the majority of archaeologists have little anthropological insight, or interest, in getting landowners to offer co-operation to «scholarly» projects.

The observations listed for each site in the Table 1 derive only from available maps, which tend to reflect ceremonial and other large structures and rarely the residential groups which abound. This means that only remote indications of what is intended can be gleaned from the available literature. All of the sites now known, or even listed by Ricketson and Blom (1924) are not included. No analysis of the following data has been attempted were maps of the «core area» of the Maya (see Ruppert 1940; Rathje et al. 1978) comparable in detail one might attempt to determine if Plaza Plan 2, or any other plan, were concentrated within this region. In the absence of hard data, in 1979 I left the theoretical fabrications to others while urging scholars to provide the kinds of basic data necessary to understanding subjects about which we are still so ignorant. How naïve I was regarding the actual goals of my fellow archaeologists.

A diligent study of the Morley (1937: Pl. 188) map of Tikal reveals nothing indicating the presence of a Plaza Plan 2, yet they abound on the Carr and Hazard (1961) map (ca. 15% of all architectural groups: Becker 1999). Even Plaza Plan 1 at Tikal is

not clearly evident on early maps. Therefore, the following listing of the Plaza Plan 2 incidence has the term «NO» to indicate «not evident» on the available map in 1979. An annotated list of sites suggesting possible presence of Plaza Plan 2 groups and a bibliography was compiled and stored, with a note to readers that it was available on request (Becker 1979c: 22). No request was ever received.

Readers should understand that this list was compiled at a time when very few maps of great detail had been generated for any lowland Maya site. The Morley maps are useful only for providing some indication of the size and complexity of a site center, but they are almost useless for the kind of research that involves plaza plans (e.g. see under Naranjo). I suggest that all the Morley map data be considered as very preliminary. Modern field survey people who are not sensitized to variations in structure configurations also may generate maps that fail to depict the detail necessary as a basis for this level of research. Survey crews need to be optimal at their task.

The efforts of Piotr Kołodziejczyk and many other young scholars (e.g. Gámez 2003, 2004) to use site maps to plan field strategies and to understand Classic Period Maya cultural dynamics are to be lauded. Collecting the basic evidence, as with any scientific endeavor, is only the first stage of a very long process. Having a theoretic model that has proven useful in predicting ritual behavior, not to mention the locations of huge and elaborate tombs, offers researchers an effective means of planning their use of time and money.

Table 1: Estimations of possible presence of groups conforming to Tikal Plaza Plan 2 (PP2) at Maya sites based on maps available in 1979 (with some additions)

Site	Number	References
Altar de Sacrificios, El Petén	None	Morley 1937: 191; Willey and Smith 1969: map
Altun Ha, Belize	Str. B4 has a series of 7 sequential tombs and appears to be a perfect example of PP2 at this site.	Pendergast 1969
Aguas Calientes, El Petén	One possible example	Morley 1937: Pl. 200
Aguateca, El Petén	No evident examples of PP2, but possible examples may be present.	Graham 1967: 2; Vinson 1960
Baking Pot, Belize	Possible	Ricketson 1929: Pl. 1: Rice 1974: 78
Balakbal, Campeche	Possible examples	Morley 1937: Pl. 218; Ruppert and Denison 1943: Pl. 69
Barton Ramie, Belize	Unknown	Willey et al. 1965: 277; Rice 1974: 181
Becan, Campeche	None evident	Ruppert and Denison 1943: Pl. 68
Benque Viejo, Belize	Not evident	Rice 1974: 169 ; Morley 1937: Pl. 191
Cahal Pichik, Belize	None evident	Morley 1937: Pl. 198
Calakmul, Campeche	Yes. The excellent mapping of Ruppert and Denison, conducted in 1932 and 1933 not only revealed examples of PP2, but also at least one E-group (PP 10). Their maps were not surpassed until Folan (Folan et al. 2001) led a team there from 1982 to 1989.	Ruppert and Denison 1943: Pl. 61.

Camp 6, Belize	None evident	Thompson 1931: 279; Rice 1974: 65
Cancuen, El Petén	No evident examples of PP2	Tourtellot et al. 1978: 209-201; Morley 1937: Pl. 196).
Cenote Group, Tayasal	Yes. Maps by W. R. Coe and others confirm Morley's depictions more clearly.	Morley 1937: Pl.208
Cerros, Belize	Group 6 may be an example of PP2	Freidel 1979: 41
Chichen Itzá	Possible	Ruppert 1935
Chochkitam	None evident	Morley 1937: Pl. 193.
Chunhuitz	None evident	Morley 1937: Pl. 210
Copan	Confirmed. In 1979, based on the available maps, I noted that Structure 26, with its magnificent hieroglyphic stairway, is situated on the east of a large plaza and may be an example of a Plaza Plan 2 arrangement. The overall plan of Copan did not appear to me to be similar to that of Quiriguá, as had been suggested in the pre-1979 literature. Quiriguá's main architectural group is clearly a PP2 (Becker 1972), later confirmed through excavation (but that interpretation has been suppressed). When I first worked at Copan I realized immediately that Str. 16 (Rosalila) was a temple on the east of its plaza, and a clear PP2. At that time I also became focused on Str. 3 as a temple diagnostic of a PP2, just as Str. 26 is a diagnostic structure for what I believe to be an elite residential PP2 group.	Morley 1920: Pl. 6; Becker 1972, 1983a. Cf. Becker and Cheek 1983
Culucbalon, Campeche	Insufficient data	Ruppert and Denison 1943: Pl. 73
El Chile, El Petén	Probable. A double temple on the east (PP2 subcategory C1) may be present.	Maler 1901-1903: 96-8
E1 Encanto, El Petén	Two probable examples	Morley 1937: Pl. 187
El Pabellón, México	One possible group	Morley 1937: Pl. 200
El Puente, Honduras	The main group is a PP2	Yde 1938: 52-4, fig. 26
Hatzcab Keel, Belize	Possible	Morley 1937: Pl. 198
Itsimté, El Petén	No examples known	Morley 1937: Pl. 207
Itzan, E1 Petén (50 km. by water west of Sayaxche).	Probably no PP2 groups evident from first maps	Tourtellot et al. 1978: 245
Iximché, Chimaltenango	Str. 3 and possibly others may be of PP2 configuration	Guillemin 1965
Ixkun, El Petén	Possible	Morley 1937: Pl. 196
Ixlú, El Petén	Possible	Morley 1937: Pl. 210
Jaral, Honduras (North shore of Lake Yojoa)	Mound 4 seems to be of PP2 form	Yde 1938: Fig. 9
Kinal, El Petén	Probably Str. 64, and also Str. 131 are temples on the east	Graham 1967: Fig. 21
La Florida (along the middle of the Río San Pedro Martir).	Strs. 6-9 at the south of the site, and probably the group directly to the north.	Graham 1970: 431
La Honradez, El Petén	Possible	Morley 1937: Pl. 193
La Joyanca, El Petén	Suspected PP2 groups. This site was not included earlier. One of the many midsized sites mapped in recent decades.	Gámez 2003, 2004

Lamanai (Indian Church), Belize	Probably a PP2 indicated by a small mound on LIP plaza	
La Muñeca, Campeche	Possible	Ruppert and Denison 1943: Pl. 62
Los Naranjos, Honduras	Probably. Only 8 groups had been mapped, but Group 1 seems to include a PP2c type, and Str. 6 in Gr. 4 may be a temple or shrine of a PP2.	Baudez and Becquelin 1973: fig. 33, 41
Lubaantun, Belize	Yes. The Pl. 95 group may be a. PP2. Are ritual structures at Lubaantun more commonly located on the south side of groups?	Hammond 1975: 219. Compare the Hammond map with Morley's 1937: Pl. 213; see also Rice 1974: 35
Machaquila, El Petén	Possibly Strs. 27, 44, 47	Graham 1967: 52
Mayapan	Probably some residential groups conform to PP2. See A. L. Smith's data on oratories (1962: 220-221, Fig. 11; cf. Pollock 1962).	Adams 1953; Sabloff et al. 1974: 408.
Motúl de San José, El Petén	No	Morley 1937: Pl. 209
Minanha, Belize	Possible	Joyce et al. 1927: 321; Rice 1974: 67
Mirador, El Petén	Yes	Graham 1967: Fig. 29
Naachtun, El Petén	Possible; also an «E-Group» type and ball court.	Morley 1937: Pl. 206; Ruppert and Denison 1943: Pl. 66
Nakbe, El Petén	Probably	Graham 1967: 48
Nakum, El Petén	Yes. Observations from the maps available in 1979 have been verified recently by the focused and successful excavation of a PP2 at Nakum Group 43, and possibly 30 and 35, at the eastern periphery of the mapped area also conform to PP2. The Temple on the east of patio group 43 has the long low platform extending to the north that also has been noted as common at Tikal. These structures have yet to be investigated.	Tozzer 1913; Morley 1937: Pl. 194; Hellmuth n.d; Źrałka 2007; Źrałka et al. 2006: 383, Fig. 5 lower, 2011, 2012
Naranjo (12 km. N.E. of Laguna Yaxha), El Petén	Several possible examples, although the Morley maps show none.	Graham and von Euw 1975; Morley 1937: Pl. 192, 195
Nochebuena, Quintana Roo	No	Ruppert and Denison 1943: Pl. 63
Nohmul, Belize	Possible	Gann and Gann 1939: 2; Rice 1974: 119
Nohoch Ek, Belize	No. A possible «E-Group» may be seen, and that may indicate an early date for the site.	Coe and Coe 1956: 371; Rice 1974: 76
Okolhuitz, Belize	Insufficient data	Ruppert and Denison 1943: Pl. 71
Oxpemul, Campeche (South of Calakmul).	Possible. An «E-Group» is noted. Cf. Nohoch Ek.	Ruppert 1934; Ruppert and Denison 1943: Pl. 67
Palustum, Chiapas	Yes. Johnson describes several sites from the intermediate plains in Chiapas (Santa Rosa, Belisario Dominguez, Nansal, El Bari) that have PP2 groups, but his interpretations may not be accurate.	See J. Johnson 1975, ms.
Pechal, Campeche	Unlikely	Ruppert and Denison 1943: Pl. 74
Peor es Nada, Quintana Roo	Probable	Ruppert and Denison 1943: Pl. 75

Piedras Negras, El Petén	No	Morley 1937: Pl. 202
Polol, El Petén	No	Morley 1937: Pl. 217
Pusilhá, Belize	Not evident. Possibly the ritual structure in residential groups at Pusilhá lies on the south side.	Rice 1974: 24; Morley 1937: Pl. 199
Quiriguá	Yes	Morley 1937: Pl. 214-5; Becker 1972; Jones et al. 1977: 4, 5, 11
Río Bec, Campeche	No	Ruppert and Denison 1943: Pls. 64, 65
San Clemente, El Petén	No	Morley 1937: Pl. 207
San Estevan, Belize	Possible	Bullard 1965: 65; Rice 1974: 120
Seibal	Definite examples. Tourtellot's identification of these PP2 groups as «local shrines» and efforts to relate them to a complex cargo-like ritual system appears wanting. Culbert believes them to be zone or neighborhood centers, an interpretation nearer my idea that they are oratorios in residential groups.	Tourtellot 1970: 40; Culbert 1974: 67; see Morley 1937: Pl. 199
Tayasal	Possible. There may be some Terminal Classic (Tepeu 3) examples of PP2 (A. Chase 1983:297).	Morley 1937: Pl. 208; see the Cenote Group
Teotihuacán	The Oaxaca Barrio has at least one compound in which the principal temple lies on the east, and the standard Teotihuacán residential compound (of which more than 200 are known) has the most prominent temple on the east.	Millon 1968; 1974: 349, 352; Manzanilla and Chapdelaine 2009
Topoxté, El Petén	One group on the third island may be a PP2. Other groups may reflect various Tikal patterns.	Bullard 1970: fig. 12, 268; Maler 1908; Morley 1937: Pl. 211; Hellmuth, n.d.
Uaxactun, El Petén	No PP2 groups are evident on the early maps. Being close to Tikal this site should bear similarities in this aspect of the culture but good mapping at Uaxactun remains to be done.	Morley 1937: Pl. 183
Ucanal, El Petén	Possibly. Group B may be an «E-Group».	Morley 1937: Pl. 197
Uolantun, El Petén	At least one	Morley 1937: Pl. 187
Uxul, Campeche	None evident	Ruppert and Denison 1943: Pl. 76
Xmakabatum, El Petén (South of La Honradez)	Possible	Morley 1937: Pl. 191
Xpuhil, Quintana Roo	Insufficient data	Ruppert and Denison 1943: Pl. 72
Xultun, El Petén	Possibly Group A	Morley 1937: Pl. 190
Yaxchilan, México	No	Morley 1937: Pl. 201
Yaxha, El Petén	Several PP2 groups have been reported, and also at least on PP1. The recent works at the center of Yaxha depicts at least one PP1, and several possible examples of PP2. Plans by Gámez and others will be directed toward the residential areas beyond the site core where they believe that PP2 groups can be identified.	Kidder 1933: 81-99; Morley 1937: Pl. 212; Quintana et al. 2000

7. Other Plaza Plans at Tikal

Plaza Plan 1, an enumeration or designation conferred only after a second «plaza plan» had been recognized in 1962, pertains to a ritual assemblage of buildings together with a constellation of ritual traits largely recognized through excavation. The definition of a second plaza plan at Tikal happened to pivot around the recognition of a ritual structure, but one that is an integral part of a group of structures with primarily residential functions. Further examination of the Tikal site map was undertaken in 1962 and 1963 to determine if other plaza plans could be distinguished (see Becker 1999). The focus then was on the identification of types of residential groups, but specific sets or types of ritual buildings were also sought. Soon seven possible plaza plans were suggested (see Becker 1971, 1979c) for Tikal and three others at the site were delineated by 1980.

What may be called «singularities» (specific and/or isolated structures) that appear with regularity at a site, or among sites, also enable us to understand the dynamics of culture within a specific site or series of sites. Thus Laporte's report of a solar observatory at Tikal (2003: 287), represented by a single round structure, may be considered as an 11th «Plaza Plan.» Other single structures that may occur at only one locus at any given site include sweat baths, or sweat houses (Satterthwaite 1952). These may conceptually be regarded on both the level of a single structure as well as conforming to a possibly distinct Plaza Plan. Any «one off» situation such as a market can be considered within a larger architectural and spatial framework to determine how these units relate to other features within a site, as well as to similar features from other sites.

Less evident in its composition is a complex «group» defined by Pugh (2001: 18, Figs. 1-4, etc.). Whether these two «plans» might also be identified at Tikal would be of interest. In the 1960s, recognition that the lowland Maya city of Tikal incorporated a wide range of forms of residential and political building clusters was a factor in concluding that Maya society was socially complex and divided into a number of city-states (Becker 1982: 117-120, 2001). Most of the PPs found at Tikal also can be found at other sites, enabling us to make comparisons between sites, and regions, that reveal spheres of influence, site dynamics and histories.

Table 2: The various Plaza Plans identified at Tikal. (Numbers 1 through 10 are described at length elsewhere [Becker 2003a], with specific page numbers within that publication included below)

Plaza Plan	Pg. Nos. (Becker 2003a)	Notes and Comments
1	258	Twin-Pyramid Complex (see Jones 1969).
2	258-262	Group with a temple originally centered on the eastern margin of the main plaza (Becker 1971, 1999). Possibly evolved from "E-Groups", see A. Chase and Chase 1995). Plaza Plan 2 variations. A number of regular variations on the PP2 pattern have been noted at lowland Maya sites, but their meanings are far from evident. Most common is the pattern in which two, or paired temples are located on the eastern margin of a residential group (Becker 1999). Also recognized as a regular architectural variation of the PP2 pattern is the presence on the north side of the temple of a long, low structure seemingly abutting or near the northern temple platform.

3	262	"Normal" residential group composed of neatly arranged rectangular structures (Haviland 2014). This quadrangular arrangement of structures places buildings on two or more sides, all low and rectangular. Regularity or formality of arrangement is the most characteristic features (e.g. Tikal Gr. 3B-11).
4	262-264	Similar to PP3, but including a central courtyard shrine (CCS; see Becker 2005, 2009a). Generally a normal rectangular group, but with the diagnostic low, rectangular platform occupying a position roughly at the center of the plaza; (e.g. Gr. 6E-2 composed of Strs. 6E-143/6 and Gr. 6E-3). This arrangement originally had been termed «Pattern W» by Becker. Site TC 8 in the Teotihuacán Valley (Sanders 1965: 110-112, 179 fig. 12) and one part of Sitio Ruiz (Lowe 1959: 32) have groups with a similar pattern. Trophy heads offered in caches seem to characterize these structures (detailed in Becker 2009b).
5	264	Groups with irregularly arranged structures of relatively small size (e.g. Tikal Gr. 4F-2). Informal and apparently random or sprawling grouping of residential structures (Haviland et al. 1985).
6	264-265	"Temple Triad" that includes temples at the east, west and north of a plaza. Also called the Tikal North Acropolis Plan (Coe 1990; cf. Folan et al. 2001). This elite plan includes temples on North, West, and South of a relatively large plaza (e.g. Tikal Gr. 5D-1). Created on Tikal's North Acropolis during Early Classic and sustained into the Late Classic Period (Coe 1964: 411, 1967: 42).
7	265	Seven Sisters Plan is a variant of PP2 but found only in extremely large architectural groups. Seven temples on east of rectangular plaza. (e.g. Gr. 5D-9; including Strs. 5D-92/99 and possibly 5D-29/31.
8	265	Ball courts (possibly related to "skull racks"?). The "plan" of these structures may be among the first identified as present in many Mesoamerican cities and beyond, and perhaps remains the best documented architecturally. Excavations remain minimal. Ball courts are common at Tikal and elsewhere (see Andrews 1975: fig. 7). Architectural units composed of two or more buildings in which at least two are arranged to form an alley or «ballcourt» provide a distinct plaza plan. Whether the constructions forming the court itself should be conceptualized as a single building, such as Str. 5D-74, or as a complete group need not be answered at this time. More important is the ability to recognize the form of such groups and to determine their function from surface clues prior to excavation. Three ballcourts were recognized at Tikal alone (Coe 1967: 50). The three ballcourts known from Tikal include a single court (Str.5D74) located to the south of Temple I and a triple court (Strs. 5D-78/81) located south of the Temple Reservoir. The third court (Strs. 5D-41/ 42 and 5E-31) is in the East Plaza, to the rear of Temple I (Coe 1967: 73). Apparently these groups functioned in the same way as did ballcourts known from the time of the Conquest. Both ritual and athletics were involved, suggesting a high degree of internal cultural consistency. The ball game, pok-ta-pok is described in historic accounts such as Torquemada's account of 1723 (Blom 1932: 499), in which he notes that "Each ball-court was a temple … « and relates data concerning idols and ceremonies associated with the ballcourts. This information provides a rare situation in which a number of functions can be associated with a group of identifiable form through the use of historic documents. The discovery of ballcourts at numerous sites demonstrates how the recognition of a Plaza Plan may be used to trace functional similarities between sites over a considerable geographic area and through time. In addition to the ballcourts at Tikal (Carr and Hazard 1961) a ballcourt dated to 9.17.0.0.0 is known from Copan. This covers two earlier ballcourts at this same locus, the earliest dating from the Early Classic. Ballcourts are also known from Palenque, Uxmal, Piedras Negras, Chichen Itzá, Lubaantun, Cahal Pech (only briefly noted by Satterthwaite 1951) and numerous other sites throughout the Maya area. These courts are all oriented with the long axis of the playing field extending' from north to south. Other ball courts, with similar arrangements, are known from sites ranging throughout Mexico and into the southwestern United States. The problems of ball-court, nomenclature, typology and distribution need not be considered at this point (but see Satterthwaite 2005a; Acosta and Moedano 1946; Taladoire 2012).
9	265-266	Markets (Jones 1996, see also Becker 2014).
10	266-267	E-Groups (astronomical rituals?). Possibly antecedents of PP2.

Some Recently proposed Plaza Plans include

11		Round (circular base) structure. A "singular group." (Aimers et al. 2000; Laporte 2003: 287).
12		Pugh's Proposal: Ritual group with 2 (unpaired) temples on the east, 1 on the west, a "statue shrine" in the plaza area, etc. (see Pugh 2001: 18, Figs. 1-4, Pugh 2002-2004, 2003a, 2003b; Duncan 2005a: Fig. 15.6; Pugh et al. 2012).

13	Sweathouse: This is another singular "group» (Satterthwaite 1952, 2005b; Ichon 1977).
14	Long Plaza Plan: An unusually long plaza with structures on four sides. The minimum length and the length/width ratios have yet to be defined.
15	L-shaped Plans: as with PP 14, the criteria associated with this arrangement, and any potential significance, have yet to be defined.
16	Causeways. These architectural features have been noted for decades but only minimally tested.
17	Even less likely to be defined as distinct plaza plans, or architectural patterns, are (A) semi-circular constructions, and (B) U-shaped groups are suggested at Piedras Negras.

8. Discussion: Politics and «Plaza Plans»

Colby's suggestion (1976: 74-5) that the Postclassic Maya saw the rise of a new religion opposed to ancestor worship might be considered in light of evidence shed by studies of plaza plans. Ancestor worship may have continued, but the means by which it was expressed may have shifted due to changing economics. At least his suggestion encourages a search for evidence for continuities. A lack of such findings, judiciously sought, would support Colby's thesis.

In seeking to support or negate some of the many «theories», many appearing to be randomly promulgated by archaeologists without any logical basis in evidence –or even ethnologically available data, we can at least call for some effort to standardize terminology. Human paleontology has suffered from a failure to establish criteria for establishing new genus and species names. This failure now plagues the subject of human «races.» Denial of racial variation in a species that covers the world would be an interesting biological phenomenon. Thus matters of human evolution and variation suffer the same kinds of ills seen in archaeology. Making up new names to describe previously described patterns provides numerous benefits, but advancing scholarship is not one of them. For example, D. Z. Chase and Chase (1982) ignore scientific precedent in creating their own terminology in order to describe PP2 groups in various contexts. They suggested that 13 «Gallery-patio» or «Patio-quadrangle» structures can be identified at Chichen Itzá; groupings that they believed are replicated by Str. 20 at Nohmul and possibly Str. 47 at Copan (cf. Becker 1986b). As they point out, the final phases of these groups may have a Terminal Classic date and relate to important changes in Maya history. This may be the case, but by inserting new terminology their conclusions are needlessly limited in scale, and thus in importance.

Recognition of patterning within residential as well as ritual groups enables us to recognize the working of Maya sites of the Classic period as well as how these large urban polities evolved and how they changed through time (Becker 1988b). Our ability to recognize spheres of political influence has been massively improved through the decipherment of texts. The texts reveal polities and alliances, which were subject to change through the results of conflict. More substantial or lasting cultural patterns may be reflected in architecture as well as mortuary programs. For now, recognition of architectural patterning is far more simple a task than is involved in burial and other excavations. For the Classic period lowland Maya plaza plan recognition remains one of the more simple mechanisms available on which to structure field projects.

9. Conclusions

1. The identification of building groups from the surface requires extremely good mapping techniques plus skilled interpretation of often very limited evidence. Since sampling in archaeology is expensive, a good map can result in much greater efficiency in understanding the composition of a site.

2. Excavation data reveals that buildings of different shapes probably have different functions, an observation in line with Satterthwaite's (1944) form-function concepts.

3. Tentative evaluations of excavation data suggests that Plaza Plan 1 at Tikal reflects a ritual/calendric function while Plaza Plan 2 and others (3 through 5) had primarily residential associations.

4. Residential groups of different forms probable reflect differences in the occupants' social class.

5. Variations in architectural patterns, and social class, suggest a relatively complex (urban?) society.

6. These observations apply primarily to the Classic period, being evident in the Early Classic, developing in the Middle Classic (500-650 CE), and achieving greatest diversity in the Late Classic period. The increased incidence of Plaza Plan 2, decentralization of religion, and possible Mexican origins of Plaza Plan 4 all provide direct evidence for the kinds of change taking place between 800 and 900 CE.

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10. Bibliographical References

Acosta, Jorge R., and Hugo Moedano K.
1946 «Los juegos de pelota,» in *México prehispánico: culturas, deidades, monumentos*, Jorge Abilio Vivó, ed., pp. 365-384. México: Editorial Emma Hurtado.

Adams, Robert McCormick
1953 «Some Small Ceremonial Structures at Mayapan.» *Current Reports* 1, pp. 144-179. Department of Archaeology. Washington DC: Carnegie Institution of Washington.

1968 «Archaeological Research Strategies: Past and Present.» *Science* 160: 1187-1192.
1969 «The Study of Ancient Mesopotamian Settlement Patterns and the Problem of Urban Origins.» *Sumer* 25: 111-124.

Aimers, James J., Terry G. Powis, and Jaime J. Awe
2000 «Preclassic Round Structures of the Upper Belize River Valley.» *Latin American Antiquity* 11 (1): 71-86.

Andrews, George F.
1975 *Maya Cities: Placemaking and Urbanization*. Norman: University of Oklahoma Press.

Ashmore, Wendy
1977 «Research at Quirigua, Guatemala: The Site Periphery Program.» Paper presented at the 42nd Annual Meetings of the Society for American Archaeology.
1981 «Some Issues of Method and Theory in Lowland Maya settlement Archaeology,» in *Lowland Maya Settlement Patterns*, Wendy Ashmore, ed., pp. 37-69. School of American Research Advanced Seminar Series. Albuquerque: University of New Mexico Press.
2007 *Settlement Archaeology at Quiriguá, Guatemala*. Quiriguá Reports 4. University Museum Monograph 126. Philadelphia: University of Pennsylvania Museum.

Aveni, Anthony F., and Sharon L. Gibbs
1976 «On the Orientation of Precolumbian Buildings in Central Mexico.» *American Antiquity* 41: 510-517.

Baudez, Claude F., and Pierre Becquelin
1973 *Archeologie de los Naranjos, Honduras*. Collection Etudes Mésoaméricaines, 2. Mexico : Mission Archéologique et Ethnologique Française au Mexique.

Becker, Marshall Joseph
1963 *Small Structure Excavations at Tikal, Guatemala*. Thesis presented to the Department of Anthropology, University of Pennsylvania in partial fulfillment of Master's Degree requirements (published as Haviland et al. 1985).
1971 *The Identification of a Second Plaza Plan at Tikal, Guatemala and its Implications for Ancient Maya Social Complexity*. Ph.D. Dissertation, University of Pennsylvania. Ann Arbor: University Microfilms.
1972 «Plaza Plans at Quirigua, Guatemala.» *Katunob* 8: 47-62.
1973 «Archaeological Evidence for Occupational Specialization among the Classic Period Maya at Tikal, Guatemala.» *American Antiquity* 38: 396-406.
1975 «Moieties in Ancient Mesoamerica: Inferences on Teotihuacán Social Structure.» *American Indian Quarterly*, Part 1, Vol. 2: 217-236; Part 2, Vol. 2: 315-330.
1979a «Priests, Peasants, and Ceremonial Centers: The Intellectual History of a Model,» in *Maya Archaeology and Ethnohistory*, N. Hammond and G. R. Willey, eds., pp. 3-20. Austin: University of Texas Press.
1979b *Theories of Ancient Maya Social Structure: Priests, Peasants, and Ceremonial Centers in Historical Perspective*. Katunob. Occasional publications in Mesoamerican Anthropology 12. Greeley: University of Northern Colorado. (Reissued in 1984 as Number 53 in the Occasional Publications in Anthropology [Ethnology Series], Museum of Anthropology, University of Northern Colorado).
1979c «Plaza Plans and Settlement Patterns: Regional and Temporal Distributions as Indicators of Cultural Interactions in the Maya Lowlands.» Paper presented at the

XLIII International Congress of Americanists: Symposium on «Interdisciplinary Approaches to Maya Studies» Vancouver, 16 August.

1982 «Ancient Maya Houses and their Identification: An Evaluation of Architectural Groups at Tikal and Inferences Regarding their Functions.» *Revista Española de Antropología Americana* 12: 111-129.

1983a «Excavaciones en El Corte de la Acrópolis,» in *Introducción a la Arqueología de Copán, Honduras*, Volumen II, Cap. 9, pp. 349-379. Tegucigalpa: Instituto Hondureño de Antropología e Historia.

1983b «Kings and Classicism: Political Change in the Maya Lowlands during the Classic Period,» in *Highland-Lowland Interaction in Mesoamerica: Interdisciplinary Approaches*, Arthur G. Miller, ed., pp. 159-200. Washington D.C.: Dumbarton Oaks Research Library and Collection.

1984 «The Development of Polity in Mesoamerica as Interpreted Through the Evolution of Plaza Plans Suggested Influences of the Central Mexican Highlands on the Maya Lowlands.» *Revista Española de Antropología Americana* l4: 47-84.

1986a «El patrón del asentamiento en Tikal, Guatemala, y otros sitios mayas de las tierras bajas: implicaciones para el cambio cultural.» *Mayab* 2: 7-20.

1986b «The Abandoned Heart of Copan, Honduras: Reconstruction of a Classic Period Maya City in Ruins by the Sixteenth Century,» in *Los mayas de los tiempos tardíos*, Miguel Rivera and Andres Ciudad, eds., pp. 31-61. Madrid: Sociedad Española de Estudios Mayas.

1986c «Household Shrines at Tikal, Guatemala: Size as a Reflection of Economic Status.» *Revista Española de Antropología Americana* 16: 81-85.

1988a «Caches as Burials; Burials as Caches: The Meaning of Ritual Deposits among the Classic Period Lowland Maya,» in *Recent Studies in Pre-Columbian Archaeology*, Nicholas J. Saunders and Olivier de Montmollin, eds., pp.117-142. Oxford: BAR International Series, 421.

1988b «Changing Views of the Changing Maya: Evolution and Devolution in an Ancient Society.» *Revista Española de Antropología Americana* 18: 21-35.

1990 «Estructura social en la evolución de los Estados políticos de Mesoamérica,» in *Los mayas: el esplendor de una civilización*, Andrés Ciudad Ruiz, ed., pp. 49-61. Madrid: Quinto Centenario y Turner.

1991 «Plaza Plans at Tikal, Guatemala, snd at Other Lowland Maya Sites: Evidence for Patterns of Culture Change.» *Cuadernos de Arquitectura Mesoamericana* 14: 11-26.

1992 «Burials as Caches, Caches as Burials: A New Interpretation of the Meaning of Ritual Deposits Among the Classic Period Lowland Maya,» in *New Theories on the Ancient Maya*, Elin C. Danien and Robert J. Sharer, eds., pp. 185-196. University Museum Monograph 77 (Symposium Series Volume 3). Philadelphia: University of Pennsylvania.

1993 «Earth Offerings among the Classic Period Lowland Maya: Burials and Caches as Ritual Deposits,» in *Perspectivas antropológicas en el mundo maya*, M. Josefa Iglesias Ponce de León and Francesc Ligorred Perramon, eds., pp. 45-74. Madrid: Sociedad Española de Estudios Mayas.

1994 «Kings and Kin Groups: The Evolution and Devolution of States» (Review Article). *Latin American Anthropology Review* 6 (1): 41-44.

1999 *Excavations in Residential Areas of Tikal: Groups with Shrines*. Tikal Report 21, University Museum Monograph 104. Philadelphia: The University Museum, University of Pennsylvania.

2001 «Houselots at Tikal, Guatemala: It's What's Out Back That Counts,» in *Reconstruyendo la ciudad maya: el urbanismo en las sociedades antiguas*, A. Ciudad Ruiz, M.J. Iglesias Ponce de León and M.C. Martínez Martínez, eds., pp. 427-460. Madrid: Sociedad Española de Estudios Mayas.

2003a «Plaza Plans at Tikal: A Research Strategy for Inferring Social Organization and Processes of Culture Change at Lowland Maya Site,» in *Tikal: Dynasties, Foreigners, & Affairs of State. Advancing Maya Archaeology*, Jeremy A. Sabloff, ed., pp. 253-280. Santa Fe: School of American Research Press.

2003b «A Classic Period *Barrio* Producing Fine Polychrome Ceramics at Tikal, Guatemala: Notes on Ancient Maya Firing Technology.» *Ancient Mesoamerica* 14 (1): 95-112.

2004 «Maya Heterarchy as Inferred from Classic-Period Plaza Plans.» *Ancient Mesoamerica* 15 (1): 127-138.

2005 «Plaza Plan 4 en Tikal, Guatemala: 'The Central Altar Group Plan' como influido por contactos con México,» in *Los investigadores de la cultura maya* 13, Tomo I, pp. 77-86. Campeche: Universidad Autónoma de Campeche.

2009a «Tikal: Evidence for Ethnic Diversity in a Prehispanic Lowland Maya State Capital,» in *Domestic Life in Prehispanic Capitals: A Study of Specialization, Hierarchy, and Ethnicity*, Linda R. Manzanilla and Claude Chapdelaine, eds., pp. 89-104. Ann Arbor: University of Michigan Press.

2009b «Skull Rituals and Plaza Plan 4 at Tikal: Lowland Maya Mortuary Patterns.» *The Codex* 17 (1-2/2008-09): 12-41.

2010 «Nightfall on the Tikal-Uaxactun Trail, by Donald Callender as told to Marshall Becker.» *The Codex* 18 (3): 16-19.

2014 «Ancient Maya Markets: A Critique of Methods for Detection.» *The Codex* 22 (1-2): 3-16.

Becker, Marshall Joseph, and Charles D. Cheek

1983 «La Estructura 10L-18,» in *Introducción a la arqueología de Copán, Honduras*, Vol. II, pp. 381-500. Tegucigalpa: Instituto Hondureño de Antropología e Historia.

Blom, Frans

1924 «Report on the Preliminary Work at Uaxactun, Guatemala.» *Year Book* 23: 217-219. Washington DC: Carnegie Institution of Washington.

Bullard, William R., Jr.

1970 «Topoxte, a Postclassic Maya Site in Petén, Guatemala,» in *Monographs and Papers in Maya Archaeology*, William R. Bullard, ed., pp. 247-307. Papers of the Peabody Museum of Archaeology and Ethnology 61. Cambridge: Harvard University.

Bullen, Ripley Pierce

1951 «The Enigmatic Crystal River site.» *American Antiquity* 17 (2): 142-143.

1953 «The Famous Crystal River site.» *Florida Anthropologist* 6 (1): 9-37.

1966 «Stelae at the Crystal River site, Florida.» *American Antiquity* 31 (6): 861-865.

Carr, Robert F., and James Hazard

1961 *Map of the Ruins of Tikal, El Peten, Guatemala*. Tikal Report 11. Museum Monographs. Philadelphia: The University Museum, University of Pennsylvania.

Chase, Arlen F.

1983 *A Contextual Consideration of the Tayasal-Paxcaman Zone, El Peten, Guatemala*. Ph.D. Dissertation in Anthropology. Philadelphia: University of Pennsylvania.

Chase, Arlen F., and Diane Z. Chase
1995 «External Impetus, Internal Synthesis, and Standardization: E Group Assemblages and the Crystallization of Classic Maya Society in the Southern Lowlands,» in *The Emergence of Lowland Maya Civilization: The Transition from the Preclassic to the Early Classic*, Acta Mesoamericana 8, Nikolai Grube, ed., pp. 87-101. Möckmühl: Anton Saurwein.

Chase, Diane Z., and Arlen F. Chase
1982 «Yucatec Influence in Terminal Classic Northern Belize.» *American Antiquity* 47 (3): 596-614.

Coe, William R.
1964 «Current Research: Eastern Mesoamerica (Tikal).» *American Antiquity* 29 (3): 407-414.
1965 «Tikal: Ten Years of Study of a Maya Ruin in the Lowlands of Guatemala.» *Expedition* 8 (1): 5-56.
1967 *Tikal: A Handbook of the Ancient Maya Ruins*. Philadelphia: University Museum of Pennsylvania.
1990 *Excavations in the Great Plaza, North Terrace and North Acropolis of Tikal* (6 vols.). Tikal Report 14, University Museum Monograph 61. Philadelphia: The University Museum, University of Pennsylvania.

Coe, William R., and Michael D. Coe
1956 «Excavations at Nohoch Ek.» *American Antiquity* 21 (4): 370-382.

Coggins, Clemency C.
1967 *Palaces and the Planning of Ceremonial Centers in the Southern Maya Lowlands*. Ms. on file in the Tozzer Library, Peabody Museum, Harvard University.
1975 *Painting and Drawing Styles at Tikal*. Ph.D. Dissertation, University of Harvard. Ann Arbor: University Microfilms.

Cohodas, Marvin
1973 «The Iconography of the Panels of the Sun, Cross and the Foliated Cross at Palenque.» Paper delivered at the XIII Mesa Redonda, Sociedad Mexicana de Antropología, México.

Colby, Benjamin N.
1976 «The Anomalous Ixil – Bypassed by the Postclassic?» *American Antiquity* 41 (1): 74-80.

Culbert, T. Patrick
1974 *Lost Civilizations: The Story of the Classic Maya*. New York: Harper and Row.

Duncan, William
2005 *The Bioarchaeology of Ritual Violence in Postclassic El Peten, Guatemala (AD 950-1524)*. Ph.D. Dissertation in Anthropology. Carbondale: Southern Illinois University.

Fialko, Vilma
2000 «Recursos hidráulicos en Tikal y sus periferias,» in *XIII Simposio de Investigaciones Arqueológicas en Guatemala, 1999*, J. P. Laporte, H. Escobedo, B. Arroyo y A. C. de Suasnávar, eds., pp. 556-565. Guatemala: Museo Nacional de Arqueología y Etnología.

FLANNERY, Kent V.
1968 «Archaeological Systems Theory and Early Mesoamerica,» in *Anthropological Archaeology in the Americas*, Betty J. Meggers, ed., pp. 67-87 Washington DC: The Anthropological Society of Washington.
1972 «The Cultural Evolution of Civilizations.» *Annual Review of Ecology and Systematics* 3: 399-426.
1976 *The Early Mesoamerican Village*. New York: Academic Press.

FOLAN, William J., Ellen R. KINTZ, and Laraine A. FLETCHER
1983 *Cobá, a Classic Maya Metropolis*. New York: Academic Press.

FOLAN, William J., Laraine A. FLETCHER, Jacinto MAY HAU, and Lynda Florey FOLAN
2001 *Las Ruinas de Calakmul, Campeche, México: un lugar central y su paisaje cultural*. Campeche: Universidad Autónoma de Campeche.

FREIDEL, David A.
1979 «Culture Areas and Interaction Spheres: Contrasting Approaches to the Emergence of Civilization in the Maya lowlands.» *American Antiquity* 44 (1): 36-54.

GÁMEZ, Laura Lucía
2003 *Áreas ceremoniales en conjuntos residenciales del Área Maya: el Grupo Guacamaya del sitio arqueológico La Joyanca, Petén*. Tesis de Licenciatura. Escuela de Historia, Área de Arqueología. Guatemala: Universidad de San Carlos.
2004 «El sector ritual del Grupo Residencial Guacamaya, La Joyanca,» in *XVII Simposio de Investigaciones Arqueológicas en Guatemala, 2003*, J. P. Laporte, B. Arroyo, H. Escobar and H. Mejía, eds., pp. 518-529. Guatemala: Museo Nacional de Arqueología e Etnología.

GANN, Thomas W. F.
1900 «Mounds in Northern Honduras.» *Annual Report* 19: 655-692. Washington DC: Bureau of American Ethnology.

GANN, Thomas W. F., and Mary F. GANN
1939 *Archaeological Investigations in the Corozal District of British Honduras*. Anthropological Papers, 7. Bulletin 123. Washington DC: Bureau of American Ethnology.

GRAHAM, Ian
1967 *Archaeological Explorations in El Peten, Guatemala*. Publication Series 33, Middle American Research Institute. New Orleans: Tulane University.
1970 «The Ruins of La Florida, Peten, Guatemala,» in *Monographs and Papers in Maya Archaeology*, William R. Bullard, ed., pp. 425-456. Papers of the Peabody Museum of Archaeology and Ethnology 61. Cambridge: Harvard University.

GRAHAM, Ian, and Eric VON EUW
1975 *Corpus of Maya Hieroglyphic Inscriptions*, Vol. 2, Part 1. Cambridge: Peabody Museum of Archaeology and Ethnology, Harvard University.

GRIFFIN, James B.
1966 «Mesoamerica and the Eastern United States in Prehistoric Times,» in *Handbook of Middle American Indians, Vol. 4*, *Archaeological Frontiers and External Connections*, pp. 111 –132. Austin: University of Texas Press.

Guillemin, George F.
1965 *Iximché: capital del antiquo reino Cakchiquel*. Guatemala: Tipografía Nacional.

Hammond, Norman
1975 *Lubaantun: A Classic Maya Realm*. Cambridge: Peabody Museum of Archaeology and Ethnology, Harvard University.

Haviland, William A.
1965 «Prehistoric Settlement at Tikal, Guatemala.» *Expedition* 7 (3): 14-23.
1977 «Dynastic Genealogies from Tikal, Guatemala: Implications for Descent and Political Organization.» *American Antiquity* 42 (1): 61-67.
2014 *Excavations in Residential Areas of Tikal. Non-elite groups without shrines: The Excavations*. Tikal Report 20A, University Museum Monograph 139. Philadelphia: The University Museum, University of Pennsylvania.

Haviland, William A., with Marshall J. Becker, Ann Chowing, Keith A. Dixon, and Karl Heider
1985 *Excavations in Small Residential Groups of Tikal: Groups 4F-l and 4F-2*. Tikal Report l9, University Museum Monograph 58. Philadelphia: The University Museum, University of Pennsylvania.

Hellmuth, Nicholas
n. d. *Maps of Nakum and Topoxté*. Copies on file, Becker Archives, West Chester University.

Ichon, Alain
1977 «A Late Postclassic Sweathouse in the Highlands of Guatemala.» *American Antiquity* 42 (2): 203-209.

Johnson, Jay K.
1975 «Micropatterns in the Settlement of the Intermediate Plains, Chiapas, Mexico.» Paper presented at the 40th Annual Meetings of the Society for American Archaeology, Dallas, Texas.

Jones, Christopher
1969 *The Twin-Pyramid Group Pattern: a Classic Maya Architectural Assemblage at Tikal, Guatemala*. Ph.D. Dissertation, University of Pennsylvania. Ann Arbor: University Microfilm.
1977 «Inauguration Dates of Three Late Classic Rulers of Tikal, Guatemala.» *American Antiquity* 42 (1): 28-60.
1996 *Excavations in the East Plaza of Tikal* (2 volumes). Tikal Report 16, University Museum Monograph 92. Philadelphia: The University Museum, University of Pennsylvania.

Jones, Christopher, Wendy Ashmore, and Robert J. Sharer
1977 *The Quirigua Project 1977 Report*. University Museum Monograph 37. Philadelphia: The University Museum, University of Pennsylvania.

Joyce, Thomas A., J. Cooper Clark, and J. Eris S. Thompson
1927 «Report on the British Museum Expedition to British Honduras, 1927.» *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 57: 295-323.

Kidder, Alfred V.
1933 «Division of Historical Research.» *Carnegie Institution of Washington Yearbook* 32 (1932-1933): 81-99.

Laporte Molina, Juan Pedro
2003 «Thirty Years Later: Some Results of Recent Excavations at Tikal,» in *Tikal: Dynasties, Foreigners, & Affairs of State. Advancing Maya Archaeology*, Jeremy A. Sabloff, ed., pp. 281-318. Santa Fe: School of American Research Press.

Leventhal, Richard M.
1981 «Settlement Patterns in the Southeast Maya Area,» in *Lowland Maya Settlement Patterns*, Wendy Ashmore, ed., pp. 187-210. Santa Fe: School of American Research and University of New Mexico Press.

Lowe, Gareth W.
1959 *Archaeological Exploration of the Upper Grijalva River, Chiapas, Mexico*. Papers of the New World Archaeological Foundation 2. Provo: Brigham Young University.

Maler, Teobert
1901-03 *Researches in the Central Portion of the Usumatsintla Valley: Report of Exploration for the Museum 1897-1900*. Memoirs 2, Numbers 1-2. Cambridge: Peabody Museum, Harvard University.
1908 *Explorations in the Department of Peten, Guatemala, and Adjacent Region: Topoxte, Yaxha, Benque Viejo, Naranjo*. Memoir 4, Number 2. Cambridge: Peabody Museum, Harvard University.

Manzanilla, Linda, and Claude Chapdelaine (eds.)
2009 *Domestic Life in Prehispanic Capitals: A Study of Specialization, Hierarchy, and Ethnicity*, Memoir 46. Ann Arbor: University of Michigan Press.

Martin, Paul S.
1971 «The Revolution in Archaeology.» *American Antiquity* 36 (1): 1-8.

Millon, René
1968 «Urbanization at Teotihuacan: The Teotihuacan Mapping Project,» in *Actas y Memorias del XXXVII Congreso Internacional de Americanistas 1966*, Vol. 1: 105-125. Buenos Aires: Librart S.R.L.
1974 «The Study of Urbanism at Teotihuacan, Mexico,» in *Mesoamerican Archaeology: New Approaches*, N. Hammond, ed., pp. 335-362. Austin: University of Texas Press.

Morley, Sylvanus Griswold
1937 *The Inscriptions of Petén*. Publication 437. Washington DC: Carnegie Institution of Washington.

Nutini, Hugo
1968 *San Bernardino Contla: Marriage and Family Structure in a Tlaxcalan Municipio*. Pittsburgh: University of Pittsburgh Press.

Pasztory, Esther
1977 «The Xochicalco Stelae and a Middle Classic Deity Triad in Mesoamerica,» in *Actas del XXIII Congreso Internacional de Historia del Arte*, Vol. 1, pp. 185-215. Granada: Departamento de Historia del Arte, Universidad de Granada.

Peebles, Christopher S., and Susan M. Kus
1977 «Some Archaeological Correlates of Ranked Societies.» *American Antiquity* 42 (3): 421-48.

Pendergast, David M.
1969 *Altun Ha, British Honduras (Belize): The Sun God's Tomb*. Royal Ontario Museum Art and Archaeology Occasional Paper 19. Toronto: University of Toronto Press.

Pollock. H. E. D.
1962 «Introduction to Mayapan, Yucatan, Mexico,» in *Mayapan, Yucatan, Mexico*. Publication 619, pp. 1-22. Washington DC: Carnegie Institution of Washington.

Pugh, Timothy W.
2001 *Architecture, Ritual, and Social Identity at Late Postclassic Zacpeten, Peten, Guatemala: Identification of the Kowoj*. Ph.D. Dissertation in Anthropology. Carbondale: Southern Illinois University.
2002-04 «Activity Areas, Form and Social Inequality in Residences at Late Postclassic Zacpeten, Peten, Guatemala.» *Journal of Field Archaeology* 29 (3-4): 351-367.
2003a «A Cluster and Spatial Analysis of Ceremonial Architecture at Late Postclassic Mayapán.» *Journal of Archaeological Science* 30: 941-953.
2003b «The Exemplary Center of the Late Postclassic Kowoj Maya.» *Latin American Antiquity* 14 (4): 408-430.

Pugh, Timothy W., José Rómulo Sánchez, and Yuko Shiratori
2012 «Contact and Missionization at Tayasal, Petén, Guatemala.» *Journal of Field Archaeology* 37 (1): 3-19.

Quintana, Oscar, Wolfgang W. Wurster, and Bernard Hermes
2000 «El plano del sitio maya de Yaxhá, Petén, Guatemala.» *Beitrage zur Allgenainem und Vergleichenden Archaologie* 20: 261-286.

Rappaport, Roy A.
1971 «The Sacred in Human Evolution.» *Annual Review of Ecology and Systematics* 2: 23-44.

Rathje, William L., David A. Gregory, and Frederick M. Wiseman
1978 «Trade Models and Archaeological Problems: Classic Maya Examples,» in *Mesoamerican Communication Routes and Cultural Contacts*, Thomas A. Lee and Carlos Navarrete, eds., pp. 147-175. Papers of the New World Archaeological Foundation 40. Provo: Brigham Young University.

Rice, Don Stephen
1974 *The Archaeology of British Honduras: A Review and Synthesis*. Katunob. Occasional Publications in Mesoamerican Anthropology 6. Greeley: Museum of Anthropology, University of Northern Colorado.
1976 *The Historical Ecology of Lakes Yaxha and Sacnab, El Petén, Guatemala*. Ph.D. Dissertation in Anthropology. State College: Pennsylvania State University.
1978 «Population Growth and Subsistence Alternatives in a Tropical Lacustrine Environment,» in *Prehistoric Maya Agriculture*, Peter D. Harrison and Billie L. Turner II, eds., pp. 35-61. Albuquerque: University of New Mexico Press.

Ricketson, Oliver G.
1929 «Excavations at Baking Pot, British Honduras.» *Contributions to American Archaeology* 1 (1): 1-27. Publication 403. Washington DC: Carnegie Institution of Washington.

Ricketson, Oliver G., and F. Blom
1924 *Index of Ruins in the Maya Area*. Cambridge: Peabody Museum, Harvard University.

Ruppert, Karl
1934 «Explorations in Campeche.» *Year Book* 33: 93-95. Washington DC: Carnegie Institution of Washington.
1935 *The Caracol at Chichen Itzá, Yucatan, Mexico*. Publication 454. Washington DC: Carnegie Institution of Washington.
1940 «A Special Assemblage of Maya Structures,» in *The Maya and Their Neighbors*, Clarence L. Hay et al., eds., pp. 222-231. New York: Cooper Square Publisher, Inc.

Ruppert, Karl, and Jonn H. Denison, Jr.
1943 *Archaeological Reconnaissance in Campeche, Quintana Roo, and Peten*. Publication 543. Washington DC: Carnegie Institution of Washington.

Ruz Lhuillier, Alberto
1965 «Tombs and Funerary Practices of the Maya Lowlands,» in *Handbook of Middle American Indians Vol. 2*, *Archaeology of Southern Mesoamerica Part 1*, pp. 441-461. Austin: University of Texas Press.

Sabloff, Jeremy A., William L. Rathje, David A. Friedl, Judith G. Connor, and Paula S.W. Sabloff
1974 «Trade and Power in Postclassic Yucatan: Initial Observations,» in *Mesoamerican Archaeology: New Approaches*, N. Hammond, ed., pp. 397-416. Austin: University of Texas Press.

Sabloff, Jeremy A., and Gair Tourtellot
1991 *The Ancient Maya City of Sayil: The Mapping of a Puuc Region Center*. Middle American Research Institute Publication 60. New Orleans: Tulane University.

Satterthwaite, Linton
1944 *Piedras Negras Archaeology: No. 1 Architecture. Part 20: Temples*. Philadelphia: University of Pennsylvania Museum.
1951 «Cahal Pech. Reconnaisance in British Honduras.» *University Museum Bulletin* 16 (1): 21-37.
1952 *Piedras Negras Archaeology: Architecture. Part V: Sweathouses*. Philadelphia: University of Pennsylvania Museum.
2005a «Ballcourt Terminology,» in *Piedras Negras Archaeology, 1931-1939*, by Linton Satterthwaite, Mary Butler and John Alden Mason (John M. Weeks, Jane A. Hill and Charles Golden eds.), pp. 205-240. Philadelphia: University of Pennsylvania Museum.
2005b «Sweathouses,» in *Piedras Negras Archaeology, 1931-1939*, by Linton Satterthwaite, Mary Butler and John Alden Mason (John M. Weeks, Jane A. Hill and Charles Golden eds.), pp. 241-337. Philadelphia: University of Pennsylvania Museum.

Sears, W. H.
1958 «Burial Mounds of the Gulf Coastal Plain.» *American Antiquity* 23 (3): 274-283.

Smith, A. Ledyard
1962 «Residential and Associated Structures at Mayapan,» in *Mayapan, Yucatan, Mexico*, H.E. D. Pollock, ed., pp. 165-320. Publication 619. Washington DC: Carnegie Institution of Washington.

Stenholm, Nancy A.
1978 «Identification of House Structure in Maya Archaeology: A Case Study at Kaminaljuyu,» in *Settlement Pattern Excavations at Kaminaljuyu, Guatemala*, Joseph W. Michels, ed., pp. 31-182. State College: The Pennsylvania State University Press.

Stevens, John L.
1841 *Incidents of Travel in Central America, Chiapas, and Yucatan*. London: John Murray.

Struever, Stuart (comp.)
1971 *Prehistoric Agriculture*. American Museum Sourcebooks in Anthropology 15. New York: Natural History Press for the American Museum of Natural History.

Taladoire, Eric
2012 *Ballgames and Ballcourts in Prehispanic Mesoamerica: A Bibliography*. BAR International Series 2338. Oxford: Archaeopress.

Thompson, Edward H.
1938 *The High Priest's Grave, Chichen Itzá, Yucatán, Mexico*. A manuscript prepared for publication with notes and introduction by J. Eric S. Thompson. Field Museum of Natural History, Anthropological Series 27 (1) Chicago: Field Museum Press.

Thompson, Donald E., and J. Eric S. Thompson
1955 *A Noble's Residence and its Dependencies at Mayapan*. Department of Archaeology. Current Reports 25. Washington DC: Carnegie Institution of Washington.

Thompson, J. Eric S.
1931 *Archaeological Investigations in the Southern Cayo District, British Honduras*. Anthropological Series 17 (3). Chicago: Field Museum of Natural History.

Tourtellot, Gair III
1970 «The Peripheries of Seibal: An Interim Report,» in *Monographs and Papers in Maya Archaeology*, William R. Bullard, ed., pp. 405-419. Papers of the Peabody Museum of Archaeology and Ethnology 61. Cambridge: Harvard University.
1988 *Excavations at Seibal, Department of Petén, Guatemala: Peripheral Survey and Eexcavation, Settlement and Community Patterns*. Memoirs 16 (1). Cambridge: Peabody Museum of Archaeology and Ethnology, Harvard University.

Tourtellot, Gair III, Norman Hammond, and Richard M. Rose
1978 «A Brief Reconnaissance of Itzan,» in *Excavations at Seibal*, Gordon R. Willey, general ed. Memoirs 14 (3): 241-250. Cambridge: Peabody Museum of Archaeology and Ethnology, Harvard University.

Tourtellot, Gair, Jeremy A. Sabloff, and Robert Sharer
1978 «A Reconnaissance of Cancuen,» in *Excavations at Seibal*, Gordon R. Willey, general ed. Memoirs 14 (2): 191-240. Cambridge: Peabody Museum of Archaeology and Ethnology, Harvard University.

Tozzer, Alfred M.
1913 *A Preliminary Study of the Prehistoric Ruins of Nakum, Guatemala: A Report of the Peabody Museum Expedition, 1909-1910*. Memoirs 5 (3). Cambridge: Peabody Museum of Archaeology and Ethnology, Harvard University.

Turner, Billie L. II
1976 «Population Density in the Classic Maya Lowlands: New Evidence for Old Approaches.» *Geographical Review* 66: 73-82.

Turner, Billie L., and William E. Doolittle
n.d. «Models of Settlement Growth and the Lowland Maya.» Paper presented at the International Congress of Americanists, Vancouver, 1979.

Vinson, George L.
1960 «Two Important Recent Archaeological Discoveries in Esso Concessions, Guatemala.» *Standard Oil Company Exploration Newsletter* (March): 114-122.

Vogt, Evon Z.
1961 «Some Aspects of Zinacantan Settlement Patterns and Ceremonial Organization.» *Estudios de Cultura Maya* 1: 131-145.

Voorhies, Barbara
1972 «Settlement Patterns in Two Regions of the Southern Maya lowlands.» *American Antiquity* 37 (1): 115-126.

Wauchope, Robert
1939 *Modern Maya Houses. A Study of Their Archaeological Significance*. Publication 502. Washington DC: Carnegie Institution of Washington.

Willey, Gordon R., William R. Bullard, Jr, John B. Glass, and James C. Gifford
1965 *Prehistoric Maya Settlements in the Belize Valley*. Papers of the Peabody Museum of Archaeology and Ethnology 54. Cambridge: Harvard University.

Willey, Gordon R., Richard M. Leventhal and William L. Fash, Jr.
1978 «Maya Settlement in the Copan Valley.» *Archaeology* 31 (4): 32-43.

Willey, Gordon R. and H. Ledyard Smith
1969 *The Ruins of Altar de Sacrificios, Department of Peten, Guatemala: An Introduction*. Papers of the Peabody Museum of Archaeology and Ethnology 62, 1. Cambridge: Harvard University.

Winter, Marcus C.
ms. «Classic Period Households in the Valley of Oaxaca and the Mixteca Alta.» Paper delivered at the 41st Annual Meeting of the Society for American Archaeology. St. Louis. 1976.

Wrotenbery, Lori and Eleanor King
1977 *It Takes Two to Rumba: A Report on the Preliminary Survey of Prehistoric Maya Settlement in the Eastern End of the Copan Valley*. B.A. Thesis, Dept. of Anthropology. Cambridge: Harvard University.

Yde, Jens
1938 *An Archaeological Reconnaissance of Northwestern Honduras: A Report of the Work of the Tulane University–Danish National Museum Expedition in Central America 1935*. Acta Archaeologica, Vol. IX. Copenhagen: Levin and Munksgaard. Middle American Research Series 9. Middle American Research Institute. New Orleans: Tulane University.

Źrałka, Jarosław
2007 *The Nakum Archaeological Project: Investigations on the Banks of the Holmul River, Guatemala*. Report to FAMSI. Electronic document, http://www.famsi.org/reports/06022/06022Zralka01.pdf, accessed at 12/15/2014.

Źrałka, Jarosław, Bernard Hermes and Zoila Calderón
2006 «Periphery of the Maya Site of Nakum, Petén, Guatemala: Results of Research Carried Out Between 2001 and 2003,» in *Recherches archeologiques de 1999-2003*, pp. 375-396. Krakow: Institute of Archaeology of the University of Krakow.

Źrałka, Jarosław, Wiesław Koszkul, Bernard Hermes and Simon Martin
2012 «Excavation of Nakum Structure 15: Discovery of Royal Burials and Accompanying Offerings.» *The PARI Journal* 12 (3): 1-20.

Źrałka, Jarosław, Wiesław Koszkul, Simon Martin and Bernard Hermes
2011 «In the Path of the Maize God: A Royal Tomb at Nakum, Petén, Guatemala.» *Antiquity* 85 (329): 890-908.